

Application No: 10/663,023

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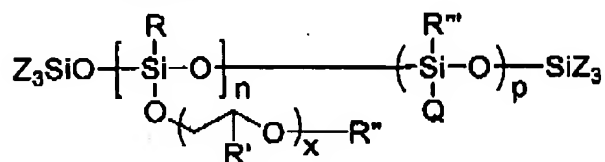
IN THE CLAIMS

Please amend the claims as follows:

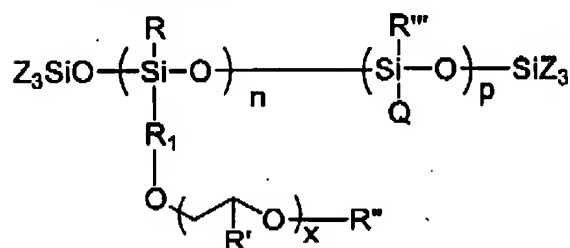
1. (currently amended) An electrochemical device, comprising:

a blended electrolyte including one or more polyalkylene glycol dialkyl ethers,
one or more alkali metal salts, and one or more siloxane polymers

the siloxane polymer including at least one material selected from the group
consisting of those represented by the following Formulas I - VI:

Formula I:

where, R and R'' are alkyl groups and R' is hydrogen or an alkyl group; R''' is alkyl or hydrogen; Q is hydrogen or a cross-linker; p is 0 or greater than 0; n is from 1 to 100; x is from 1 to 30; and Z is an alkyl or aryl group;

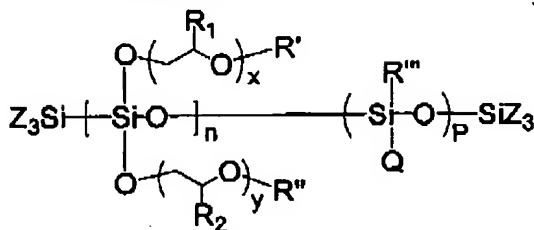
Formula II:

where, R and R'' are alkyl groups and R' is hydrogen or an alkyl group; R₁ is a spacer made up of one or more CH₂ groups; R''' is alkyl or hydrogen; Q is hydrogen or a cross-linker; p is 0 or greater than 0; n is from 1 to 100; x is 2 to 25; and Z is an alkyl or aryl group;

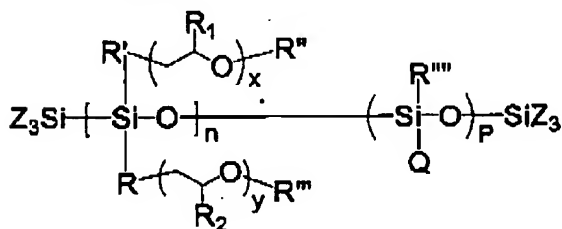
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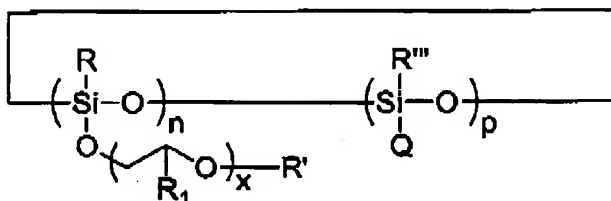
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Formula III:

wherein R'' and R' are alkyl groups; R₁ and R₂ are hydrogen or alkyl group; R''' is alkyl or hydrogen; Q is hydrogen or a cross-linker; p is 0 or greater than 0; n is from 1 to 100; x is from 1 to 30; y is from 1 to 30; Z is alkyl or aryl group;

Formula IV:

wherein R is a spacer made up of one or more CH₂ groups; R' is a spacer made up of one or more CH₂ groups; R'' and R''' are alkyl group; R₁ and R₂ are hydrogen or alkyl group; R''' is alkyl or hydrogen; Q is hydrogen or a cross-linker; p is 0 or greater than 0; n is from 1 to 100; x is from 1 to 30; y is from 1 to 30; Z is alkyl or aryl group; and

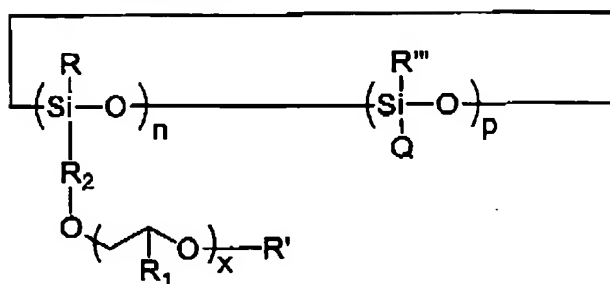
Formula V:

wherein R and R' are alkyl groups; R₁ is hydrogen or alkyl group; R''' is alkyl or hydrogen; Q is hydrogen or a cross-linker; p is 0 or greater than 0; n is from 1 to 100; x is from 1 to 30; R' is an alkyl or aryl group; and

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Formula VI:

wherein R and R' are alkyl groups; R₁ is hydrogen or an alkyl group; R₂ is a spacer made up of one or more CH₂ groups; R''' is alkyl or hydrogen; Q is hydrogen or a cross-linker; p is 0 or greater than 0; n is from 1 to 100; x is from 1 to 30; R' is an alkyl or aryl group.

2. (previously presented) The device of claim 1, wherein the one or more polyalkylene glycol dialkyl ethers includes one or more polyethylene glycol dialkyl ethers.

3.-5. (canceled)

6. (withdrawn) The device of claim 1 ~~claim 5~~, wherein the siloxane polymer includes at least two materials selected from the group consisting of those represented by Formulas I - VI.

7. (canceled)

8. (withdrawn) The device of claim 1 ~~claim 5~~, wherein the one or more polyalkylene glycol dialkyl ethers includes at least one material selected from the group consisting of those represented by Formula II.

9. (withdrawn) The device of claim 1 ~~claim 5~~, wherein the one or more polyalkylene glycol dialkyl ethers includes at least one material selected from the group consisting of those represented by Formula III.

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10. (withdrawn) The device of claim 1 ~~claim 5~~, wherein the one or more polyalkylene glycol dialkyl ethers includes at least one material selected from the group consisting of those represented by Formula IV.

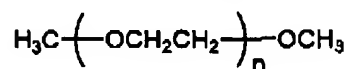
11. (withdrawn) The device of claim 1 ~~claim 5~~, wherein the one or more polyalkylene glycol dialkyl ethers includes at least one material selected from the group consisting of those represented by Formula V.

12. (withdrawn) The device of claim 1 ~~claim 5~~, wherein the one or more polyalkylene glycol dialkyl ethers includes at least one material selected from the group consisting of those represented by Formula VI.

13. (withdrawn) The device of claim claim 1 ~~claim 5~~, wherein Z is methyl, ethyl, propyl or phenyl group.

14. (previously presented) The device of claim claim 1 ~~claim 5~~, wherein the one or more polyalkylene glycol dialkyl ethers includes at least one material selected from the group consisting of those represented by the following Formula IX:

Formula IX:



wherein n = 3 to 8.

15. (previously presented) The device of claim 1, wherein the molecular weight of polyalkylene glycol dialkyl ether is less than 1,000 g/mol.

16. (previously presented) The device of claim 1, wherein the content of polyalkylene glycol dialkyl ether is in a range of 0.5 to 99.5 % of the total weight of polymer in the electrolyte.

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17. (previously presented) The device of claim 1, wherein the content of polyalkylene glycol dialkyl ether is in a range of 20 % to 60 % of the total weight of polymer in the electrolyte.

18. (previously presented) The device of claim 1, wherein the one or more alkali metal salts includes a lithium salt.

19. (previously presented) The device of claim 18, wherein a ratio of [EO]/[Li] in the electrolyte is in a range of 5 to 50.

20. (previously presented) The device of claim 1, wherein the one or more alkali metal salts includes one or more components selected from the group consisting of LiClO₄, LiBF₄, LiAsF₆, LiPF₆, LiCF₃SO₃, Li(CF₃SO₂)₂N, Li(CF₃SO₂)₃C, LiN(SO₂C₂F₅)₂, lithium alkyl fluorophosphates, and lithium bis(chelato)borates.

21. (previously presented) The device of claim 1, wherein at least one of the one or more siloxane polymers is cross-linked.

22. (previously presented) The device of claim 1, wherein the one or more siloxane polymers includes at least two siloxane polymers and at least one of the siloxane polymers is cross-linked.

23. (previously presented) The device of claim 1, wherein at least one of the one or more siloxane polymers is cross-linked with a cross-linker that includes a moiety selected from a group consisting of moieties having the formula O-(CH₂CH₂O)_q and Si-O-(Si-O)_k-Si where q is in a range of 4 to 30 and k is in a range of 5 to 30.

24. (previously presented) The device of claim 1, wherein at least one of the one or more siloxane polymers and the one or more polyalkylene glycol dialkyl ethers serves a member of an interpenetrating network.

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25. (previously presented) The device of claim 1, wherein the electrolyte includes one or more network polymers forming an interpenetrating network with at least one other polymer selected from the group consisting of the one or more siloxane polymers and the one or more polyalkylene glycol dialkyl ethers.

26. (previously presented) The device of claim 25, wherein at least one of the one or more network polymers is selected from a group consisting of a polyacrylate and a polymethacrylate.

27. (previously presented) The device of claim 26, wherein at least one of the one or more network polymers is cross-linked.

28. (previously presented) The device of claim 25, wherein at least one of the one or more network polymers is selected from the group consisting of polyacrylates and polymethacrylates.

29. (previously presented) The device of claim 25, wherein at least one of the one or more network polymers is selected so as to be fabricated from a monomer having four or more functionalities.

30. (previously presented) The device of claim 1, further comprising:
one or more matrix polymers.

31. (previously presented) The device of claim 30, wherein the one or more matrix polymers includes at least one component selected from the group consisting of: polyacrylonitrile, poly(vinylidene fluoride), poly(vinylidene fluoride-co-hexafluoropropylene), polystyrene, polyvinyl chloride, poly(alkyl methacrylate), poly(alkyl acrylate), styrene butadiene rubber (SBR), and poly(vinyl acetate).

32. (previously presented) The device of claim 1, wherein the electrolyte is a solid.

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33. (previously presented) The device of claim 1, further comprising:

at least one lithium metal oxide cathode;

at least one porous separator; and

at least one anode including at least one material selected from the group consisting of: graphite, $\text{Li}_4\text{Ti}_5\text{O}_{12}$, tin alloys, silica alloys, intermetallic compounds, and lithium metal.

34. (previously presented) The electrochemical device of claim 33, wherein the lithium metal oxide cathode includes at least one material selected from the group consisting of Li_xVO_y , LiCoO_2 , LiNiO_2 , $\text{LiMn}_{0.5}\text{Ni}_{0.5}\text{O}_2$, $\text{LiMn}_{0.3}\text{Co}_{0.3}\text{Ni}_{0.3}\text{O}_2$, LiFePO_4 , LiMn_2O_4 , LiFeO_2 , vanadium oxide, $\text{LiNi}_{1-x}\text{Co}_y\text{Me}_z\text{O}_2$ wherein Me is Al, Mg, Ti, B, Ga, Si Mn, Zn, and $\text{LiMc}_{0.5}\text{Mn}_{1.5}\text{O}_4$ wherein Mc is divalent metal such as Ni, Co, Fe, Cr, and Cu.

35.-62 (canceled)

63. (currently amended) The device of claim 1 ~~claim 5~~, wherein the one or more polyalkylene glycol dialkyl ethers includes at least one material selected from the group consisting of those represented by Formula I.

64. (currently amended) The device of ~~claim 7~~ claim 63, wherein at least one of the materials represented by Formula I is represented by Formula I with $p = 0$.